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Further records of *Myotis peshwa* (Thomas 1915) (Chiroptera : Vespertilionidae) from the Indian Peninsula[1]

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There are few records of bats of the genus *Myotis* from central and southern India or from Sri Lanka and no more than three forms have been reported from that area. One, *Myotis montivagus peytoni* Wroughton & Ryley, 1913 is known only from the Gersoppa Falls, Kanara, Mysore (Brosset 1962: 716). Another, *Myotis hasseltii* (Temminck 1840) has been recorded from four localities in Sri Lanka (Wroughton 1915: 86, Thomas 1915: 611, Phillips 1935: 125, 126). The third, *Myotis peshwa* (Thomas 1915) is apparently recorded in the literature only from two locations, one the type locality at Poona and the other Elephanta Island, off Bombay (Brosset 1962: 717).

A small collection of bats received recently at the British Museum (Natural History) from Dr. S. V. Tirodkar, of the Science College, Satara, Maharashtra State includes four further specimens of *Myotis peshwa*, obtained in the neighbourhood of Satara, while the collections in London also include additional examples collected many years ago that have not been reported hitherto. These all agree closely with the holotype and with one other specimen from Poona, largely confirming the detailed description by Thomas. In one respect, however, the original description is misleading. Thomas says "Middle upper premolar about two thirds the size in cross-section of the anterior one, slightly drawn inwards, but not completely invisible from the outside. Below, the corresponding tooth is three fourths

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the size of p^1, and stands quite in the toothrow." In the small series now available (including the holotype and the second specimen from Poona also examined by Thomas) the second or middle upper premolar (pm^3) is in fact about one third or very slightly more the cross-sectional area of the anterior tooth (pm^2). Usually in the toothrow or only slightly intruded from it, the tooth is occasionally more intruded but nevertheless remains clearly visible laterally, with pm^2 and the posterior upper premolar (pm^4) not in contact. The second or middle lower premolar (pm_3) is about the same size or even slightly larger than the anterior upper premolar (p^1 of Thomas): it is one half or a little less than one half the area of the anterior lower premolar (pm_2), and stands either in the toothrow or is slightly intruded from it, but not to the extent that pm_2 and the posterior lower premolar (pm_4) touch.

The species has been obtained from Sabalgarh, Gwalior, Madhya Pradesh, 26° 15′ N, 77° 24′ E; Elephanta Island, off Bombay, 18° 58′ N, 72° 57′ E; Poona, Maharashtra, 18° 34′ N, 73° 58′ E; near Satara, Maharashtra, *c.* 17° 43′ N, 74° 05′ E; and Kodai, Kumrun, Mangalore, Mysore, *c.* 12° 54′ N, 74° 51′ E. Specimens from all but Elephanta Island are in the collections of the British Museum (Natural History). Brosset (1962: 717) remarked of the specimen from Elephanta Island that it was roosting in a hole in the ceiling of a room with another individual, which escaped. Two of the specimens from Satara were collected from cracks in the stony ceiling of an abandoned tunnel in the forests of the Western Ghats, about two feet above the water level in the tunnel; the other two came from holes in the ceiling of a similarly abandoned tunnel. Each hole, made when the tunnel was constructed, held a pair of the bats. The first of these tunnels was shared with *Miniopterus schreibersii*, the second with *Hipposideros speoris*.

Myotis peshwa may be distinguished from *M. montivagus peytoni* by its smaller size (length of forearm in *peshwa* 36·3–40·1 mm, in *peytoni* 43·5–48·0 mm) and relatively larger foot which in length considerably exceeds one half of the length of the tibia. Although very similar externally to *M. hasseltii* it differs from this species in its narrower rostrum and braincase. Moreover, in *hasseltii* the second upper premolar (pm^3) is minute, usually about one quarter the area of the first upper premolar (pm^2) and as a rule is intruded from the toothrow to the extent that pm^2 and the posterior upper premolar (pm^4) are in contact or nearly so. The second lower premolar (pm_2) in *hasseltii* is correspondingly very small, sometimes minute, usually intruded from the row, on occasion almost completely so.

Ellerman & Morrison-Scott (1951: 149) list *peshwa* as a provisional subspecies of *Myotis adversus* (Horsfield 1824), a species which in their view, based on Tate (1941: 551), perhaps extends from Australia westwards to India. However, there is evidence (Hill 1972: 32; Hill & Thonglongya 1972: 188) to suggest that continental *Myotis* formerly referred to *adversus* should be allocated to *Myotis hasseltii* (Temminck 1840), *adversus* not extending westwards beyond Java and Borneo, where it appears to be sympatric with the easternmost of *hasseltii*. Ellerman & Morrison-Scott (1951: 149) refer *hasseltii* from Sri Lanka to "*Myotis* (?) *adversus* (?) subsp." since they say that the form quoted by Wroughton (1918) as *hasseltii* from Sri Lanka, forearm 40 mm in the key [in Wroughton 1918: 598] cannot be *hasseltii*, as Tate shows this to be a small form, with forearm 32 mm. Tate (1941: 557) quotes Temminck

TABLE

MEASUREMENTS (IN MM) OF *Myotis peshwa, M. dryas, M. horsfieldii, M. hasseltii* AND *M. adversus*

	M. peshwa			*M. dryas*	*M. horsfieldii*			*M. hasseltii*			*M. adversus*		
	N	R	M		N	R	M	N	R	M	N	R	M
Length of forearm	8	36.3-40.1	38.5	37.4*, 35.3	28	36.1-40.0	37.5	23	35.7-41.2	38.6	27	39.8-44.0	42.7
Greatest length of skull	8	15.4-16.1	15.7	15.2	25	14.6-16.0	15.4	18	15.1-16.6	15.9	8	16.3-17.4	16.9
Condylobasal length	8	14.3-14.7	14.6	14.1	25	13.2-14.7	14·0	17	13.9-15.5	14.5	8	14.9-15.8	15.4
Condylocanine length	8	13.6-14.1	13.9	13.5	25	13.0-13.9	13.4	17	13.1-14.7	13.8	8	14.0-14.9	14·6
Width across anteorbital foramina	8	3.9- 4.2	4.0	4.1	24	3.6- 4.2	3.9	17	4.2- 4.7	4.4	8	4.5- 4.7	4.5
Zygomatic width	3	9.7- 9.8	9.8	9.4	6	9.0- 9.5	9.4	6	9.8-10.3	10.1	4	10.4-10.5	10.4
Postorbital width	8	3.5- 3.9	3.7	3.7	25	3.2- 3.7	3.5	20	3.2- 4.2	4.0	8	4.0- 4.3	4.1
Width of braincase	8	7.3- 7.5	7.4	7.2	25	6.9- 7.4	7.1	19	7.6- 8.6	7.9	8	7.8- 8.0	7.9
Mastoid width	8	7.9- 8.2	8.0	7.8	24	7.5- 8.0	7.7	17	8.0- 8.7	8.4	8	8.5- 8.7	8.6
$c^1 - c^1$	8	4.0- 4.3	4.2	4.2	24	3.9- 4.3	4.1	18	4.1- 4.6	4.4	8	4.5- 4.8	4.7
$m^3 - m^3$	8	5.8- 6.1	6.0	5.9	25	5.6- 6.1	5.9	20	5.8- 6.7	6.3	8	6.4- 7.0	6.8
$c - m^3$	8	5.5- 5.8	5.7	5.7, 5.6	25	5.4- 6.0	5.7	20	5.4- 6.1	5.7	8	5 9- 6.4	6.2
Length complete mandible	8	10.6-11.0	10.8	10.7	19	10.4-11.0	10.7	11	10.3-11.6	11.1	7	11.3-11.9	11.7
Length right ramus	8	11.1-11.5	11,3	11.1	24	10.8-11.4	11,1	18	10.5-12.0	11.3	8	11.6-12.5	12.1
$c - m_3$	8	6.1- 6.3	6.2	6.0	25	6.0- 6.4	6.2	18	5.9- 6.5	6.2	8	6.3- 6.9	6.7

N = Number of specimens R = Range M = Mean * "Cotype" B.M. 6.12.1.31

(1840: 226), who says "Antebrachium 1 pouce 3 lignes" which Tate renders as 32 mm. These, however, are French inches and lines and the correct value is 34 mm as Tate found when he measured the "co-type", a young adult female. In fact, the specimens from Sri Lanka in London (a part of the sample identified by Wroughton) agree closely with *hasseltii* from Java and Malaya, as do the remainder of those examined by Wroughton, now in the collections of the Bombay Natural History Society. Brosset (1962: 715) compared *peshwa* with these in Bombay and noted their differences: he remarked (p. 715, footnote) that these specimens were called *hasseltii* but considered them representative of *adversus* with which *hasseltii* was then thought to be conspecific. As a result of his comparison he removed *peshwa* from any association with "*adversus*", i.e. from *hasseltii*.

Thomas, in the original description, regarded *peshwa* as the Indian representative of the Malayan and Javan species *M. horsfieldii*, to which he thought *peshwa* to be closely allied. There is much to commend this view, which Brosset (1962: 715) considered should be reviewed. In *horsfieldii* the wing originates from the metatarsus as in *peshwa*, the rostrum and braincase are similarly narrow, and there is a similar degree of dental reduction, the second upper premolar (pm^3) about one-quarter to one-third of the area of the anterior upper premolar (pm^2), sometimes only slightly intruded but more usually fully intruded from the toothrow and with the second lower premolar (pm_3) one third or a little more the area of the anterior lower premolar (pm_2), usually slightly intruded but occasionally more fully pushed in from the toothrow. As Thomas points out, *peshwa* is slightly larger and browner than *horsfieldii*, but the number of specimens of *peshwa* in dry preservation is limited for colour comparison.

Myotis dryas Andersen 1907 from South Andaman Island is also considered by Ellerman & Morrison-Scott (1951: 149) and by Hill (1967: 7) to be possibly a subspecies of *M. adversus*. However, this bat, represented in London only by the holotype and by a second specimen labelled "Andamans" which has no more than the rostrum and the anterior part of the mandible remaining, seems also much nearer to *horsfieldii* than to *adversus* or more especially to *hasseltii*. The insertion of the wing is at the ankle or on the metatarsus, the rostrum and braincase are narrow, and the anterior and second premolars (pm 2/2-3/3) are of similar proportions to those of *peshwa* and *horsfieldii*, pm^3 slightly intruded from the toothrow, pm_3 standing in the row. Andersen (1907: 37), who had solely the holotype of *adversus* for comparison (its skull is represented by no more than the rostrum and mandible) and lacked both *hasseltii* and *horsfieldii*, noted that the rostrum of *dryas* is lower, both anteriorly and posteriorly than that of *adversus*, and that the bony palate is narrower. While the small number of specimens at present available precludes any comprehensive revision of this group of large-footed *Myotis*, there is good evidence nevertheless to suggest that *peshwa* and *dryas* are best considered more closely related to *M. horsfieldii* than to *M. hasseltii* or to *M. adversus*.

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